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United States Patent [19][11] **Patent Number:** **6,001,130****Bryan et al.**[45] **Date of Patent:** ***Dec. 14, 1999**[54] **HUMAN SPINAL DISC PROSTHESIS WITH HINGES**[76] **Inventors:** Vincent Bryan, 4624 E. Mercer Way, Mercer Island, Wash. 98040; Alex Kunzler, 422 140th SE., Bellevue, Wash.[*] **Notice:** This patent is subject to a terminal disclaimer.[21] **Appl. No.:** 08/944,378[22] **Filed:** Oct. 6, 1997**Related U.S. Application Data**

[63] Continuation-in-part of application No. 08/681,230, Jul. 22, 1996, Pat. No. 5,674,296, which is a continuation-in-part of application No. 08/339,490, Nov. 14, 1994, abandoned.

[51] **Int. Cl.⁶** A61F 2/44[52] **U.S. Cl.** 623/17; 606/61[58] **Field of Search** 623/16, 17, 18;
606/60, 61, 70-73[56] **References Cited****U.S. PATENT DOCUMENTS**

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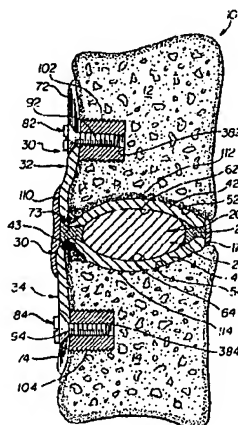
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Primary Examiner—Mickey Yu*Assistant Examiner*—Tram A. Nguyen*Attorney, Agent, or Firm*—Hill & Simpson[57] **ABSTRACT**

The invention relates to a spinal disc endoprosthesis. The endoprosthesis has a resilient body formed of one or more materials which may vary in stiffness from a relatively stiff exterior annular gasket portion to a relatively supple central nucleus portion. Concave-convex elements at least partly surround that nucleus portion so as to retain the nucleus portion and gasket between adjacent vertebral bodies in a patient's spine. Assemblies of endoprosthetic discs, endoprosthetic vertebral bodies, and endoprosthetic longitudinal ligaments may be constructed. To implant this endoprosthesis assembly, information is obtained regarding the size, shape, and nature of a patient's damaged spine. Thereafter, one or more prosthetic vertebral bodies and disc units are constructed in conformity with that information. Finally, the completed and conformed vertebral body and disc assembly is implanted in the patient's spine.

20 Claims, 10 Drawing Sheets

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